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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,766	04/19/2005	Shinji Aso	44471/314790	4323

23370 7590 10/17/2006

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EXAMINER	
RILEY, SHAWN	

ART UNIT	PAPER NUMBER
2838	

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/531,766	ASO, SHINJI	
	Examiner	Art Unit	
	Shawn Riley	2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-10 and 13* is/are rejected.

7)☒ Claim(s) *5,6,11 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *apr05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

2. Claims 7-12 objected to under 37 C.F.R. 1.75(a) because of the following informalities: claims 7-12 the wording "according to any one of claim" is at best awkward. Appropriate correction is required.

Claim Rejections - 35 U.S.C. § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 7-10 and 13 are rejected under 35 U.S.C. §102(b) as being fully anticipated by Yasumura (U.S. Patent 6,320,765). Yasumura shows,[1] (in, e.g., the(ir) figures and corresponding disclosure)

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1 Note claims will be addressed individually and the material in parentheses are the examiner's annotated comments. Further unless needed for clarity reasons, recited limitation(s), will be annotated only upon their first occurrence. Annotated claims begin with the phrase "As to claim". Claims that are not annotated are seen as having already had the invention(s) addressed previously in an annotated claim and

As to claim 1. A direct-current converter comprising: a first serial circuit which is connected to both ends of a direct-current power supply and in which a primary winding (L1) of a transformer and a main switch (Q1) are serially connected to each other; a second serial circuit which is connected to both ends of the main switch or both ends of the primary winding of the transformer and in which an auxiliary switch (Q2) and a capacitor (C_{CL}) are serially connected to each other; a rectifying/smoothing circuit (DBR) configured to rectify and smooth a voltage generated in a secondary winding of the transformer by energy supplied from the primary winding of the transformer when the main switch is turned on, the voltage being rectified and smoothed using a rectifying device and a smoothing device (C2); and a control circuit (15,14, 13, 12B, 11, 12A.. i.e., 10) configured to turn on/off the main switch and the auxiliary switch alternately using a signal with predetermined switching frequency (based on 11), wherein the control circuit reduces the switching frequency during light load (see, e.g., figures 2A-2P which show waveforms based on the control circuit during at least minimum load conditions).

As to claim 2. The direct-current converter according to claim 1, wherein the control circuit includes: bottom detection means configured to detect a minimum voltage of the main switch after the auxiliary switch is turned off (see, e.g., column 13 lines 14-20); and control signal

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may be repeated for convenience of the applicant/examiner. Bolded words/phrases indicate rejected material based 112 paragraph rejections. Underlined words/phrases indicate objected to material. For method claims, note that under MPEP 2112.02, the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986). Therefore the previous rejections based on the apparatus will not be repeated.

generation means configured to generate a control signal which turns on the main switch at time of the minimum voltage of the main switch based upon an output of the bottom detection means.

As to claim 3. The direct-current converter according to claim 1, wherein the control circuit, during further light load, leads to a burst mode where the switching frequency is further reduced (burst mode equivalent during light loading situation).

As to claim 4. The direct-current converter according to claim 2, wherein the control circuit, during further light load, leads to a burst mode where the switching frequency is further reduced (burst mode equivalent during light loading situation).

As to claim 7. The direct-current converter according to any one of claim 1, further comprising: a reactor (e.g. in figure 5, the reactor connected between the primary/Cr/gate of the Q1) connected between the primary winding of the transformer and the main switch; and an auxiliary transformer which is serially connected to the transformer and causes a flux of energy, that is stored in the reactor when the main switch is turned on, towards the secondary winding side when the mains switch is turned off (this is a fly-back reaction).

As to claim 8. The direct-current converter according to any one of claim 2, further comprising: a reactor connected between the primary winding of the transformer and the main switch (e.g. in

figure 5, the reactor connected between the primary/Cr/gate of the Q1); and an auxiliary transformer which is serially connected to the transformer and causes a flux of energy, that is stored in the reactor when the main switch is turned on, towards the secondary winding side when the mains switch is turned off (this is a fly-back reaction).

As to claim 9. The direct-current converter according to any one of claim 3, further comprising: a reactor connected between the primary winding of the transformer and the main switch (e.g. in figure 5, the reactor connected between the primary/Cr/gate of the Q1); and an auxiliary transformer which is serially connected to the transformer and causes a flux of energy, that is stored in the reactor when the main switch is turned on, towards the secondary winding side when the mains switch is turned off (this is a fly-back reaction).

As to claim 10. The direct-current converter according to any one of claim 4, further comprising: a reactor connected between the primary winding of the transformer and the main switch (e.g. in figure 5, the reactor connected between the primary/Cr/gate of the Q1); and an auxiliary transformer which is serially connected to the transformer and causes a flux of energy, that is stored in the reactor when the main switch is turned on, towards the secondary winding side when the mains switch is turned off (this is a fly-back reaction).

As to claim 13. The direct-current converter according to claim 7, wherein the reactor includes a leakage inductor between a primary winding and a secondary winding that are wound around the

transformer to be loosely coupled to each other, and the primary winding of the transformer and the second winding of the auxiliary transformer are wound around a core of the transformer to be closely coupled to each other (Yasumura's coil is loosely wound).

Allowable Subject Matter

3. Claims 5-6 and 11-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. As allowable subject matter has been indicated, applicant's response must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 C.F.R. § 1.111(b) and section 707.07(a) of the M.P.E.P.

5. The following is an examiner's statement of reasons for allowance: As to claim 5, no prior art uncovered anticipates or renders obvious applicant(s) claimed direct-current converter including a value of the error voltage signal generated by the error voltage generation means reaches a first threshold; and pulse width control means configured to control a pulse width in accordance with the output voltage and generate a pulse signal which includes the switching frequency reduced in accordance with the frequency control signal generated by the frequency control means, wherein the control signal generation means generates the control signal based upon the pulse signal from the pulse width control means and the output from the bottom detection means.

Conclusion

Any inquiry from other than the applicant/attorney of record concerning this communication or earlier communications from the Examiner should be directed to the Patent Electronic Business Center (EBC) at 1.866.217.9197. Any inquiry from a member of the press concerning this communication or earlier communications from the Examiner or the application should be directed to the Office of Public Affairs at 703.305.8341. Any inquiry from the applicant or an attorney of record concerning this communication or earlier communications from the Examiner should be directed to Examiner Riley whose telephone number is 571.272.2083. The Examiner can normally be reached Monday through Thursday from 7:30-6:00 p.m. Eastern Standard Time. The Examiner's Supervisor is Karl Easthom who can be reached at 571.272.1989. Any inquiry about a case's location, retrieval of a case, or receipt of an amendment into a case or information regarding sent correspondence to a case **should be directed to 2800's Customer Service Center** at 571.272.2815. Any papers to be sent by fax MUST BE sent to fax number **571-273-8300**. Any inquiry of a general nature of this application should be **directed to the Group receptionist** whose telephone number is 571.272.2800. Status information of cases may be found at http://pair-direct.uspto.gov wherein unpublished application information is found through private PAIR and published application information is found through public PAIR. Further help on using the PAIR system is available at 1.866.217.9197 (Electronic Business Center).

October 06

Shawn Riley
Primary Examiner